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*The Relationship
of Self-Efficacy,
Identity Style,
and Stage of
Change with
Academic Self-
Regulation*

The purpose of this study was to examine the relationship between academic self-regulation, self-efficacy, and two student self-belief systems, identity style and stage of change, for 210 college students enrolled at a private research university. High scores on the informational identity, contemplation stage, and action stage subscales and low scores on the diffuse/avoidant identity subscale were correlated with high self-regulation scores. The degree that the students have invested effort in establishing their identity as students (informational identity style) and their willingness to improve their study skills (action stage of change) significantly increased the proportion of variance explained in students' self-regulation scores. Implications for learning strategies instruction are discussed.

As students transition from high school to college, they need to learn how to take greater personal control of their learning. Researchers have found that the more successful students are in implementing strategies that lead to personal control, or self-regulation of their learning, the more likely they are to be successful learners (Schunk & Ertmer, 1999; Zimmerman & Kitsantas,

1997; Zimmerman & Martinez-Pons, 1990; Zimmerman & Risemberg, 1997). From a social cognitive view, the key self-regulation beliefs and processes involve an integration of metacognition (e.g., self-awareness, self-monitoring), motivation (e.g., self-efficacy, intrinsic interest), and behavior (e.g. help seeking, self-instruction) (Zimmerman, 1989).

Educational researchers have found that efficacy beliefs are important predictors of student motivation and self-regulatory skills (Schunk, 1989). Students with high efficacy are more likely than their low-efficacy counterparts to choose difficult tasks, expend greater effort, persist longer, use more complex learning strategies, and experience less fear and anxiety regarding academic tasks.

Self-efficacy has been shown to have a direct and indirect effect on academic achievement (e.g., Zimmerman, Bandura, & Martinez-Pons, 1992). For example, Pintrich and DeGroot (1990) found that self-efficacy was not a significant predictor of academic achievement, but was related to self-regulatory skills that directed predicted achievement. They found that self-efficacy was a predictor of academic achievement when self-regulation was not included in the path analysis, but it was not a significant predictor when self-regulation was included as a predictor. Other researchers have shown that self-efficacy is related to self-regulated learning variables (e.g., Pintrich & Schrauben, 1992; Pokay & Blumenfeld 1990; Schunk, 1985).

Since self-regulatory skills and processes are important factors in learning strategy programs (Dembo, 2004; Dembo & Praks Seli, 2004; Hofer, Yu, & Pintrich, 1998), it is important to understand what student characteristics, in addition to self-efficacy, may influence the acquisition of self-regulatory behavior. Hofer, Yu, and Pintrich (1998) point out that the beliefs that students bring to college may constrain or facilitate the development of greater personal control over the learning process. In this investigation, we explore two belief systems not previously linked with academic self-regulation, identity style and stages of change, in the expectation that these variables will extend our understanding of self-regulation.

Identity Style

Berzonsky (1992, 1998) developed a social-cognitive model of the processes that underlie the development of Marcia's (1966) four identity statuses (diffuse, foreclosed, moratorium, and achievement). He referred to the processes as *identity styles*, and these styles distinguish the ways individuals process and evaluate self-relevant information as they construct their self-identity. The most involved of these styles is the *informational* style, where individuals actively seek out, elaborate,

and utilize self-relevant information when involved in problem solving and decision-making. These people have engaged, and are willing to continue to engage, in a high level of self-exploration, a characteristic associated with Marcia's achievement and moratorium identities.

The second of Berzonsky's identity styles is the *normative* style. These individuals have made a strong commitment to an identity without engaging in a large amount of self-exploration, or have what Marcia classified as a foreclosed identity status. Individuals with a normative identity style have major goals of conforming to the expectations of others and conserving self-constructions in the face of contradictory feedback. These individuals tend to assume that their identity is determined by external social and environmental standards and tend to use social standards such as religion, family, community, and country when making judgments. Normative individuals tend to have a high need for structure, desire cognitive closure, and to be intolerant of ambiguity (Berzonsky, 1998).

Berzonsky's third identity style is *diffuse/avoidant*. These individuals have neither engaged in self-exploration nor made a commitment to an identity. They tend to avoid dealing with problems and are motivated by hedonistic cues and situational consequences. Any changes in identity tend to be situational and short-term (Berzonsky, 1992). These individuals tend to believe their self-identity is fixed and to define themselves based on social standards such as reputation, popularity, and the impression they make on others. Diffuse/avoidant individuals tend to not engage in self-reflection, to be controlled by external influences, and to be concerned with impression management (Berzonsky, 1998).

Since identity style is related to how individuals process information and address barriers, a person's identity style may be related to the person's willingness to engage in academic self-regulation. Recent research by Boyd, Hunt, Kandell, and Lucas (2003) supports this possibility. They found that entering freshman students categorized as having an information identity processing style perceived themselves as prepared for the demands of college and were receptive to further improvements of their academic skills. Zimmerman (1998) has identified a number of strategies that must be employed in the acquisition of self-regulated learning. These strategies include self-monitoring, self-evaluation, and self-reflection and appear related to the processes used by learners in the informational processing identity style.

While Berzonsky and his colleagues have not specifically examined the relationship between identity style and academic self-regulation, they have examined the relationships between identity style and behaviors related to self-regulation. Berzonsky (1992) explored identity style with

respect to college students' academic coping and test anxiety, outcomes of self-regulation. He found that students with diffuse/avoidant and normative styles dealt with stressors by relying on avoidance methods such as distancing and wishful thinking. In contrast, students exhibiting an informational identity style used more positive coping strategies in dealing with their anxiety.

In a study of first-year college students, Berzonsky (2003) found that an informational identity style was positively correlated with awareness of internal states and self-reflection; a diffuse/avoidant identity style was negatively correlated with awareness of internal states and self-reflection, and positively correlated with self-rumination; a normative identity style was significantly correlated with self-rumination. In another study of first-year college students, Berzonsky and Kuk (2000) found that an informational identity style was a significant positive predictor of academic autonomy and of having well-defined educational goals and that a diffuse/avoidant style was a significant negative predictor. A normative identity style was not a significant predictor of academic autonomy and was a positive predictor of having well defined educational goals, though a much smaller predictor than an informational identity style.

In this investigation, we hypothesized that learners in the informational identity processing style would be more likely to engage in effective self-regulatory activities.

Stage of Change

Another variable we explore in the present investigation is *stage of change*. Skillful academic self-regulation is a time-consuming process requiring the learner to make the conscious decision to expend effort, select resources, and to engage in learning rather than other activities (Zimmerman 1986, 1989, 1995, 2000; Zimmerman & Kitsantas, 1997). Becoming a self-regulated learner requires many students to change their academic and social behaviors, often a difficult process.

Colleges provide considerable support services to help students improve their learning (see Simpson, Hynd, Nist, & Burrell, 1997 for a comprehensive review of these programs). Students are placed in these programs with the assumption that they want to change their academic behaviors. Dembo and Praks Seli (2004) have discussed the fact that many students enrolled in learning strategies courses resist changing their academic behaviors. They discuss four major reasons for this situation: (a) students believe they can't change; (b) they don't want to change; (c) they don't know what to change; or (d) they don't know how to change (adapted from Prochaska & Prochaska, 1999). Prochaska, Norcross, and DiClemente (1994) point out that "fewer than 20 percent

of a problem population are prepared for action at any given time. And yet, more than 90 percent of behavior change programs are designed with this 20 percent in mind" (p. 15). Thus, any information regarding learners' readiness to change their academic behavior could be useful to administrators and instructors in academic support services.

Prochaska and his colleagues (Brogan, Prochaska, & Prochaska, 1999; Prochaska, DiClemente, & Norcross, 1992; Prochaska et al., 1994; Prochaska & Prochaska, 1999; Redding et al., 1999) developed the transtheoretical model (TTM) to explain the process of change as it applies to the cessation of addictive behaviors such as smoking and obesity and to determine the extent to which the person is motivated to change. We included the TTM in the present investigation to determine if it could be applied in a non-medical context. Furthermore, it would be interesting to determine if poor learning and study strategies could be considered a type of dysfunctional behavior similar to the addictive behaviors that Prochaska and his colleagues have been studying for years.

In the TTM, change is not simply a transition from engaging in a risky behavior (such as smoking, over-eating, or not regulating one's behavior) to stopping such a behavior, but is rather a six-step process. The first stage of change is *precontemplation*, where there are no thoughts about changing the behavior in the foreseeable future. Two types of students would be in the precontemplation stage for changing their academic self-regulation strategies: students who are unaware of the existence and need to change their academic self-regulation, and students who are aware of the need to change but feel that the disadvantages (decreased social time, increased application of effort, increased appearance of being studious to social others) outweigh the advantages (improved grades, improved learning, respect of peers, feelings of achievement).

The second stage is *contemplation*, where there are thoughts about changing behaviors in the next six months. For students in this stage, there is a realization that their existing academic behavior is not effective. These students are considering changing their behaviors as the negative results of the current self-regulation behaviors become evident, but are often prevented from moving into the next stage because (a) the self-regulation strategies being used were previously successful in other environments, such as high school; (b) they do not know the self-regulation strategies to develop; or (c) there is no support for the change.

For students in the *preparation* stage, there is an acceptance that existing strategies will no longer be effective. Students make plans, but have not actively begun, to change the behavior. Any sense of ambiguity present during the contemplation stage is non-existent in the preparation stage; these students want to change. Students are looking for opportunities to learn and develop self-regulation strategies.

Starting to change the behavior is the hallmark of the fourth stage of the TTM, *action*. Changes at this stage are more visible to others than those made during the other stages and, therefore, receive the greatest recognition. In the fifth stage, *maintenance*, the person actively works to prevent repeating the earlier negative behavior. Maintenance often lasts for six months to two years after the action stage has begun, but in some cases may continue indefinitely. Students in the action and maintenance stages engage in effective strategies and behaviors, but require support to prevent recycling to earlier, non-effective behaviors. The final stage of TTM, *termination*, occurs when the person has completely stopped and is free of the temptation to exhibit the targeted behavior. It may not be possible for students to reach the termination stage of self-regulation, as effective self-regulation requires the ongoing use of effective strategies, not simply the ceasing of poor ones. Since the action stage is most indicative of actual behavior change, we hypothesize that learners who express the greatest willingness to change their study skills will demonstrate the highest degree of academic self-regulation.

In summary, there is a large body of literature on the relationship between skillful academic self-regulation and academic achievement. Self-efficacy has been the primary variable associated with academic self-regulation. Our intent, in the present investigation, was to identify other personal characteristics associated with self-regulation. The literature indicates that the process students use to establish their identity as students (identity style), and their willingness to engage in self-regulatory behaviors (stages of change), are two variables that may be related to academic self-regulation. More specifically, we hypothesized that the informational identity style and the action stage of change would be related to academic self-regulation.

Method

Participants

The sample consisted of 210 undergraduate students at a research university who were enrolled in a learning and study strategies class in the Fall 2000 or Spring 2001 semesters and completed a survey at the beginning of the semester. There were no differences in the responses of students enrolled in the course in their first (Fall 2000) or second (Spring 2001) semester, so the data from the two semesters were combined. There were 114 (54.3%) females and 96 (45.7%) males. The sample was ethnically diverse, with Caucasians (91, 43.3%) making up the largest group, followed by African Americans (42, 20.0%), Hispanic Americans (37, 17.6%), Asian Americans (24, 11.4%) and one Native American (.05%). Fifteen students (7.5%) did not provide ethnic information. Students

were enrolled in this course as a condition of acceptance to the university. These students entered the university with a mean grade point average (from either high school or college transfer) of 3.22, an average SAT-I Mathematics score of 548 and an average SAT-I Verbal score of 520 for a average combined score of 1068, 119 points lower than the mean university-wide mean of 1187 for students admitted in the Fall 2000 semester.

Instrumentation

Self-regulation. The students' self-regulation was measured using 9 items from the 32-item Dynamic and Active Learning Inventory (DALI) (Iran-Nejad & Chissom, 1992). The selected items measured the students' use of proactive learning strategies that are conscious, effortful, focused on the processing of external sources of information in an organized, sequential manner (e.g., "I organize my class notes to consist mainly of the important concepts, definitions, and relevant examples from class and readings") using a seven-point Likert scale (0 = *never*, 6 = *always*) (Iran-Nejad 1990; Iran-Nejad & Chissom, 1992), and are necessary to think and learn effectively in school environments (Iran-Nejad, 1990; Shapiro & Livingston, 2000). These nine items were found to be reliable (Cronbach's $\alpha = .79$) in the present study.

Self-Efficacy. Self-efficacy was measured using the nine-item Self-Efficacy subscale from the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, & McKeachie, 1991). The students responded to statements (e.g., "I expect to do very well in this class") on a seven-point Likert scale (0 = *not true of me*, 6 = *very true of me*). This scale was a highly reliable measure (Cronbach's $\alpha = .92$) in the present study.

Identity Style. Berzonsky's (1992) Identity Style Inventory (ISI3) was used to assess the students' identity style. The students responded to 30 statements on a five-point Likert scale of (0 = *not at all like me*, 4 = *very much like me*) to assess their level each of three identity styles: informational (11 items, e.g., "When I have to make a decision, I like to spend a lot of time thinking about my options," Cronbach's $\alpha = .69$); normative (9 items, e.g., "I prefer to deal with situations where I can rely on social norms and standards," Cronbach's $\alpha = .68$); and diffuse/avoidant (10 items, e.g., "When I have to make a decision, I try to wait as long as possible in order to see what will happen," Cronbach's $\alpha = .79$). The reliability coefficients were similar to those obtained by Berzonsky (1992) in the development of the ISI3 (informational = .62, normative = .66, diffuse/avoidant = .73).

In previous studies using the ISI3 (Berzonsky, 1992), the identity style

of each participant was determined by calculating the *z*-score, relative to the sample, of each participant on each of the three subscales and assigning an identity style based on the highest *z*-score. There are three problems associated with this method: (a) As the *z*-scores are relative to the sample, the *z*-score for an individual can vary depending on who completes the survey; (b) assigning a person to a single category omits information included in the other two subscales; and (c) individuals with large differences in their raw scores on a given subscale can be assigned the same identity style if that style has the highest *z*-score. In the present study, the raw scores on each of the three subscales were used.

Stage of change. The ATTS Inventory (Study Skills Format) was used (N. Dubois, personal communication, September 1, 2000) to determine the willingness of students to change. The ATTS Inventory is based on the University of Rhode Island Change Assessment Scale (URICA) (McConaughy, Prochaska, & Velicer, 1983), a scale designed to assess the willingness of persons to change unhealthy behaviors such as smoking, alcoholism, and overeating. In the ATTS, each of the 32 statements from the URICA were modified to reflect the students' own perception of their study skills. Modification of the items is recommended to make the instrument relevant and understandable to the population being studied (Rossi, Rossi, Velicer, & Prochaska, 1995) and has been previously done to the URICA without a significant change in the reliability (Greenstein, Franklin, & McGuffin, 1999).

The ATTS assessed the students on four stages of change, using eight statements for each stage: (a) precontemplation ("As far as I am concerned, I don't have any problems with studying that need changing"), (b) contemplation ("I think I might be ready for some improvement in my study skills and habits"), (c) action ("I am doing something about the problems with studying that had been bothering me"), and (d) maintenance ("I'm here to prevent myself from having a relapse of my problem with studying"). The students responded to the statements using a five-point Likert scale (0 = *strongly disagree*, 4 = *strongly agree*). In the present study, each of the four scales of the ATTS was reliable (precontemplation = .79, contemplation = .82, action = .82, and maintenance = .84), similar to the range of reliability of earlier studies using the URICA (precontemplation = .77 to .88, contemplation = .84 to .88, action = .84 to .89, and maintenance = .82 to .88 [Greenstein et al., 1999; McConaughy, DiClemente, Prochaska, & Velicer, 1989; McConaughy et al., 1983]). There were no published reliability coefficients for the ATTS.

The ATTS does not include scales to assess the preparation and termination stages. Factor analyses and reliability studies of the URICA, on

which the ATTS is based, were unable to identify a unique preparation scale. URICA questions that three raters judged as assessing preparation also had high loadings on the adjacent contemplation and action stages (Greenstein et al., 1999; McConnaughy et al., 1989; McConnaughy et al., 1983). Two explanations have been suggested for the high factor loadings of the preparation items on the adjacent stages. It has been theorized that the preparation stage involves both a contemplation of and a commitment to action, indicating a high level of involvement in each of these stages during preparation. A second hypothesis is that preparation is a brief and transitory stage in the change process, making it difficult to assess the preparation stage when the person is making the important, but quick, commitments which the URICA was designed to measure (McConnaughy et al., 1983). Items were not developed for the termination scale, as Prochaska was more concerned with individuals who were unable or unwilling to change rather than those who had successfully changed their behaviors.

It should be noted that the URICA, and thus the ATTS, was not designed to assign an individual to a particular stage, but rather as a tool to create a stage profile yielded by cluster analysis (Greenstein et al., 1999; McConnaughy et al., 1989; McConnaughy et al., 1983; Rossi et al., 1995). In the present study, the raw scores on each of the four subscales were used to examine the relationship between willingness to change and self-regulation.

Procedure

A survey questionnaire, composed of the complete DALI (Iran-Nejad & Chissom, 1992), MSLQ Self-Efficacy scale (Pintrich et al., 1991), ISI3 (Berzonsky, 1992), and ATTS Inventory (N. Dubois, personal communication, September 1, 2000; based on the URICA, McConnaughy et al., 1989; McConnaughy et al., 1983), was administered to the students during the first class session by either the graduate teaching assistant leading the seminar for one half of the students or by the faculty member teaching the lecture section for the other half of the students. Two forms of the questionnaire, with the subscales in different order, were administered to distribute fatigue effects on scales later in the instrument and to minimize any effects that one scale may have had on another scale.

Results

A two-step analysis was conducted to determine whether students' scores on the three identity processing styles (informational, normative, diffuse/avoidant) and the four stages of change subscales (precontemplation, contemplation, action, maintenance) increased our knowledge of

the self-regulation. First, the correlations between each of the subscales were calculated to determine whether significant relationships existed between self-regulation and the other scales. Second, a forward regression analysis was conducted to determine whether knowledge of the identity style and stage of change subscales increased our knowledge of the students' self-regulation scores. Table 1 presents a summary of the participants' responses to the subscales, and Table 2 presents the correlations among the variables. The SAT scores of the students in this investigation were not significantly correlated with the scores on any of the subscales and were not included in the analysis (all r s $> .140$, p s $> .05$, ns).

Table 1

Summary of Self-Regulation, Self-Efficacy, Identity Style, and Stage of Change Scores (N = 210)

	M	SD	Possible Range	Observed Range
Self-Regulation	33.69	8.38	0-54	12-50
Self-Efficacy	38.31	9.09	0-54	6-54
ISI3				
Informational Identity	28.71	5.79	0-44	17-44
Normative Identity	19.76	4.98	0-36	5-32
Diffuse Identity	16.34	7.03	0-40	2-40
ATTS				
Precontemplation	8.29	5.73	0-32	0-29
Contemplation	25.24	5.39	0-32	4-32
Action	19.50	6.09	0-32	0-32
Maintenance	15.71	6.66	0-32	0-32

The correlations between self-regulation and the identity style and stage of change subscales were consistent with the theories behind these belief systems. Students who scored high on the informational subscale, indicating that they had invested time and energy in constructing their identities as students, had significantly higher self-regulation scores; and students who scored high on the diffuse/avoidant subscale, indicating that they had invested little time and energy in constructing their identities as students, had significantly lower self-regulation scores. On the ATTS subscales, the students who scored high on the contemplation and action subscales were more likely to have high self-regulation scores.

The lack of significant correlations between most of the identity style and stage of change subscales with the self-efficacy scores reduces the likelihood of multicollinearity in the regression analysis.

Table 2
Correlations of Identity Style and Stage of Change Subscales with Self-Regulation and Self-Efficacy (N = 210)

Scale	1	2	3	4	5	6	7	8	9
1. Self-Regulation	-	.433***	.297***	.115	-.220**	-.069	.172*	.284***	.071
2. Self-Efficacy		-	.127	.049	-.215**	-.069	-.092	.100	-.136
3. Informational Identity			-	.250***	.104	.082	.247***	.332***	.255***
4. Normative Identity				-	.297***	.189**	.179**	.231***	.254***
5. Diffuse/Avoidant Identity					-	.487***	.124	.015	.358***
6. Precontemplation Stage						-	-.310***	-.148*	.082
7. Contemplation Stage							-	.607***	.566***
8. Action Stage								-	.526***
9. Maintenance Stage									-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

The normative subscale was significantly correlated with both the informational and diffuse/avoidant subscales. These correlations are consistent with the description of the normative identity style as one in which the search for an identity has been focused on (or by) significant social others. As the normative subscale was correlated with both an identity style associated with high self-regulation (informational) and an identity style associated with low self-regulation (diffuse/avoidant), it is consistent that there would not be significant relationships (either positive or negative) between the normative identity style and the self-regulation measures. Also, the correlations among the ATTS subscales are consistent with the stage of change theory. Students who scored high on the precontemplation scale (who are not aware of a need to change their study behaviors) were less likely to endorse behaviors associated with improving study skills. Students who scored high on the contemplation subscale (who are considering improving their study skills) were more likely to respond that they were ready to improve their skills (action subscale) and to seek out support to continue their improvement (maintenance subscale).

The correlations between the subscales of the ISI3 and the ATTS were also consistent with the theories behind these belief systems. The in-

formational identity subscale was significantly correlated with the contemplation, action, and maintenance stages of change. Students who reported that they had worked to define themselves as students were also more likely to report that they were willing to improve their self-regulation. The diffuse/avoidant subscale was significantly correlated with the precontemplation and maintenance subscales, suggesting that student who indicated that they had not worked to identify themselves as a student were less likely to report willingness to improve their self-regulation. The normative subscale was correlated with all of the ATTS subscales.

A forward regression analysis was conducted to determine if the scores on the ISI3 and ATTS subscales increased our knowledge of the students who are more likely to self-regulate their academic behavior (see Table 3). The subscales included in Stage 3 (informational identity and action stage) significantly increased the proportion of the variance in self-regulation explained from 18.7% to 27.7%, a 9% increase over self-efficacy alone. None of the other subscales of the ISI3 or the ATTS would have added significantly to the proportion of the variance explained and thus were not included in the forward regression analysis.

Table 3
Summary of Forward Regression Analysis for Variables Predicting College Students' Self-Regulation Scores (N = 210)

Variable	B	SE B	β
Step 1			
Self-efficacy	.399	.058	.433***
Step 2			
Self-efficacy	.370	.056	.402***
Informational Identity	.356	.011	.246***
Step 3			
Self-efficacy	.360	.055	.391***
Informational Identity	.270	.091	.187**
Action Stage	.252	.087	.183**

Note. $R^2 = .187$ ($p < .001$) for Step 1; $\Delta R^2 = .060$ ($p < .001$) for Step 2; $\Delta R^2 = .030$ ($p < .01$) for Step 3. ** $p < .01$, *** $p < .001$

Discussion

The purpose of this investigation was to determine whether information about two student self-belief systems (identity style and stage of change)

increased our ability to predict the students who were more likely to self-regulate their academic behavior than information on the students' self-efficacy scores alone. Students with high scores on the action and contemplation stage subscales tended to have higher self-regulation scores. Students with high scores on the informational subscale tended to have higher self-regulation scores and students with high scores on the diffuse/avoidant subscale scored lower in self-regulation.

As expected, there was a positive relationship between students' high scores on the contemplation and action stage subscales and increased self-regulation. However, the relationships between the other three ATTS stages and self-regulation were less clear. The lack of significant relationships between the precontemplation and maintenance subscales and the measure of self-regulation needs to be studied further. The scores on the maintenance subscale were not significantly correlated with self-regulation, an unexpected result. Although some of the students scoring high on the maintenance subscale may have felt that they were prepared to maintain excellent self-regulation skills developed earlier, some students with lower self-regulation scores may have interpreted maintenance items as confirmation that they were good self-regulators. There was also a wide range of self-regulation scores of students who scored high on the precontemplation subscale, with some strong self-regulators scoring high on this subscale because of the way the items on the ATTS were interpreted. The self-reporting of perceptions of study skills may be more subjective than reporting perceptions of behaviors such as smoking or alcohol consumption, behaviors that the URICA was designed to assess. Strong self-regulators may interpret precontemplation items as a signal that they need to actively assess their academic behaviors.

Prochaska's (Prochaska et al., 1994; Prochaska & Prochaska, 1999) stages of change construct was used for the first time in an educational setting. There needs to be much more research on the construct before it can be considered useful in understanding academic behavioral change. For example, a construct validation study of this instrument is needed as well as a longitudinal investigation to explore the timing and movement of students through the stages. The most important question that must be answered is whether or not the stages and their sequence apply to academic behavioral change.

The college student development literature (e.g., Pascarella & Terenzini, 1991; Schmidt & Hunt, 1994) indicates that freshman students' precollege motivation, aptitude, goals, and commitments vary greatly and can influence the degree to which they are ready to participate in the college experience. In addition, experiences in college can greatly

influence the development of some students but not of others. These findings have important implications for various academic support services provided to students. Students may be more open to adopt self-regulatory processes and behavior necessary to improve their academic achievement if they enter college with an informational identity processing style. This processing style would support the self-reflection and self-evaluation needed to become more self-regulated learners.

It would be useful to assess entering college students' identity processing styles as part of any assessment instruments (e.g., reading and learning strategies inventories) used in academic support programs. The data could be used to understand how different students may behave in learning strategies courses and indicate that different interventions may be needed for students with different styles of processing information. Most important, our data indicate that it may be useful to deal with identity development issues in learning strategies courses, especially to help move students from a diffused/avoidant to an informational identity style.

Assessing students' stages of change also may be useful in learning strategies courses. College students with high precontemplation stage scores may not be willing to change their academic self-regulatory behavior. These students may not see the relationship between their self-regulation skills and their achievement and may be unwilling to make changes to their academic behaviors. These students need help in identifying that their academic success is dependent on the execution of effective learning strategies and identifying weaknesses in their own learning.

An important aspect of the stages of change literature is the recommendation that different intervention strategies are related to each stage of change (see Prochaska et al., 1992). For example, individuals in the contemplation stage are more open to consciousness-raising techniques such as observations and confrontations than they are to other educational interventions. Prochaska, DiClemente, and Norcross (1992) sum up their research by stating: "We have determined that efficient self-change depends on doing the right things (processes) at the right time (stages)" (p. 1110). This research can help instructors who struggle in their attempt to help students become more self-regulated learners. It may be that students are not prepared to change their behaviors because they are not at the action stage of change. Also, many students may not be impacted in the same way by the experiences in a learning strategies course because of the incompatibility between their stage of change and the educational experiences provided.

In summary, we are suggesting that there may be more to self-regu-

lation than attempting to improve students' self-efficacy. Although self-efficacy is an important construct in understanding student motivation and academic self-regulation, we have introduced two new constructs—identity style processing and stages of change—that need further investigation. The relationship between these constructs and academic achievement needs to be examined. Do identity style and stage of change have a direct impact on achievement, or is the effect mediated by another variable, such as self-regulation? Also, the causal relationship between self-regulation, self-efficacy, identity style, and stage of change could not be determined in the present investigation. Identity style processing and stages of change may help us better understand the beliefs and behaviors of students entering courses in academic support services, and indicate new interventions that may prove successful in helping students improve their academic achievement.

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